

Application No. 10/668,387
Reply to Office Action of : February 19, 2010

Remarks

Support for the above-requested amendments to claim 1 and claim 34 is found at least in lines 6-8 of paragraph [0011] of the originally filed specification. No question of new matter arises and entry of the above-requested amendments is respectfully requested.

Claims 1, 3-4, 7, 9, 20-34, 36, and 38-41 are before the Examiner for consideration.

Rejection Under 35 U.S.C. §103(a)

In an Office Action dated August 7, 2009, Claims 1-4, 7-9, 20-34, and 36-38 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,410,397 to Kempf ("Kempf") in view of "Handbook for Pulp & Paper Technologies", 2nd Edition by Smook ("Smook"). In particular, the Examiner asserts that Kempf teaches a process for treating pulp with peroxide and metal ion additives. It is also asserted that the process includes maintaining a pulp slurry at temperatures between 40 °C and 120 °C for 0.5 to 8 hours. Further, the Examiner asserts that a peroxide is added in an amount from 0.1 to 10% and that the pH is controlled between 1 and 7. The Examiner admits, however, that Kempf fails to teach a refining step after the peroxide treatment.

In this regard, Smook is cited for assertedly teaching that it is well-known to refine pulp after the pulp has been treated in the pulping process in order to develop optimal papermaking properties with respect to the product being made. The Examiner concludes that refining the peroxide treated fibers of Kempf would have been obvious to one of skill in the art in view of Smook to optimize papermaking properties.

In response to Applicants' traversal dated November 9, 2009, the Office issued a Final Office Action dated February 19, 2009, stating that the traversal was not convincing because: a) Kempf results in a viscosity loss in the pulp; c) KSR forecloses arguments that a specific teaching, suggestion, or motivation is required to support a finding of obviousness; and d) that there is no requirement that motivation to make the modification be expressly articulated AND one of ordinary skill in the art would be motivated to refine the peroxide treated pulp to develop the optimal properties of the pulp.

Applicants' Response

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In response to the rejections and reasoning, Applicants respectfully direct the Examiner's attention to independent claims 1 and 34 and submit that claims 1 and 34 define methods for modulating the morphology of softwood fibers that are not taught or suggested within Kempf and Smook. Additionally, Applicants respectfully submit that Kempf and Smook do not teach or suggest the combination of features recited in claims 1 and 34.

Kempf teaches a peroxide-based solution and process for selectively delignifying and brightening lignocellulosic pulp. (*See, e.g.*, column 3, lines 10-13 and 45-47). **The method avoids attacking the cellulosic portion of the pulp** so as not to degrade the pulp and retard viscosity loss. (*See, e.g.*, column 3, lines 13-14 and 47-50). In the process of Kempf, an inorganic peroxide and a metal-containing additive whose metallic portion is selected from the group consisting of tin, titanium, and vanadium are included in the pulp slurry to delignify the lignocellulosic pulp. The inorganic peroxide may be used in an amount from about 0.1 to about 20% by weight based on O.D. pulp and the metal-containing additive may be used in an amount from about 0.1 to about 10% by weight based on O.D. pulp.

Kempf does not, however, teach or suggest a process that reduces fiber suspension viscosity as required by claims 1 and 34 **to cause oxidative degradation of cellulose of such softwood fibers**. Indeed and to the exact contrary of the claimed invention, Kempf specifically teaches a process that **avoids attacking the cellulosic portion of the pulp** where peroxide is used to delignify and brighten lignocellulosic pulp and retard viscosity loss. (*See, e.g.*, column 3, lines 10-14 and 45-50). It is respectfully submitted that **avoiding the attack of the cellulosic portion of the pulp** as taught by Kempf is very different from the methods claimed in claims 1 and 34 where the methods **cause oxidative degradation of cellulose of such softwood fibers**. Applicants respectfully submit that there is simply no teaching or suggestion within Kempf of a method that **causes oxidative degradation of cellulose of such softwood fibers**. In fact, it is respectfully submitted that Kempf teaches away from the claimed methods. Smook is silent regarding any teaching or suggestion of a method for modulating the morphology of softwood fibers that **causes oxidative degradation of cellulose of such softwood fibers**, and as such, cannot make up for the deficiencies of Kempf. Moreover, it is respectfully submitted that even if the teachings of Smook were combined with the teachings of Kempf, the combination would not result in the presently

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claimed methods at least because Kempf specifically teaches retarding viscosity loss.

Accordingly, Applicants submit that claims 1 and 34 are non-obvious and patentable.

In addition and contrary to the Office's conclusions of c) and d) above regarding establishment of a case of obviousness under *KSR*, Applicants submit that the Office is incorrect in its conclusory statements altogether. In fact, there is no motivation for one of skill in the art to arrive at a method for modulating the morphology of softwood fibers as claimed in claims 1 and 34 based on the disclosures of Kempf and Smook. In order to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See, e.g., *Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 7, August 2008, §2143 citing *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007)).

Applicants respectfully submit that there is no teaching or suggestion within Kempf or Smook of a method for modulating the morphology of softwood fibers that includes (1) subjecting pulp containing softwood fibers to a solution containing transitional metal ions at a concentration from about 0.002% to about 0.1% by weight based on pulp and a peroxide at a pH of between about 1 and about 9 for a time from about 10 minutes to about 10 hours at a temperature of from about 40 to 120 °C and (2) subjecting the treated fibers to a refining treatment to form refined paper making fibers, where the method reduces fiber suspension viscosity as required by claim 1 or a method for modulating the morphology of softwood fibers that includes (1) adding transitional metal ions at a concentration from about 0.002% to about 0.1% by weight based on pulp to a solution comprising peroxide to form a metal-ion activated peroxide, (2) contacting pulp including softwood fibers with the metal ion-activated peroxide at a pH of between about 1 and about 9 for a time from about 10 minutes to about 10 hours at a temperature from about 40 to 120 °C, and (3) refining the treated fibers to form fibers having a modified morphology, where the method reduces fiber suspension viscosity as claimed in claim 34 based on the teachings of Kempf and Smook because Kempf and Smook do not teach or even suggest a method that reduces fiber suspension viscosity. Indeed, it is respectfully submitted that Kempf teaches away from a method that reduces fiber suspension

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viscosity. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

To the contrary of the Office's conclusory statements c) and/or d) of the outstanding Office Action, Applicant respectfully direct the Office's attention to "Examination Guidelines Update: Developments in the Obviousness Inquiry After *KSR v. Teleflex*" (See *Federal Register Vol. 75, No. 169, pp53643-53660*). In this Office publication, the Office indicates that all of the rationales identified in the KSR Guidelines require some analysis by the Office related to show that the outcome is a "predictable outcome". If the Office cannot show this analysis or support that the outcome is a "predictable outcome", then the Office cannot sustain the obviousness rejection. In the present case, the Office makes conclusory statement that "one of ordinary skill in the art would be motivated to refine the peroxide treated pulp, to develop the optimal properties of the pulp. If Kempf is solely motivated to a method that avoids attacking the cellulosic portion of the pulp so as not to degrade the pulp and retard viscosity loss, how can the skilled artisan identify the properties of the pulp that is made from the claimed invention? Applicants respectfully submit that the Office has failed to show that the outcome of the claimed invention is a "predictable outcome" after reading/combining the references as required by "*Examination Guidelines Update*" under KSR. Further, Applicants respectfully submit that it is impossible for the Office to successfully support that the outcome is a "predictable outcome" after reading/combining the references (as required by "*Examination Guidelines Update*" under KSR) because Kempf's disclosure is clearly in opposite of that of the claimed invention (as discussed above).

Consequently, Applicants submit that because Kempf and Smook do not teach or suggest a method for modulating the morphology of softwood fibers where the method reduces fibers suspension viscosity, Kempf and Smook, alone or in combination, fail to teach all of the claim limitations set forth in claims 1 and 34. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claims 1 and 34 are not taught or suggested by Kempf and Smook and that claims 1 and 34 are, therefore, non-obvious and patentable. With respect to dependent claims 3, 4, 7, 9, 20-33, 36, and 38, Applicants submit that because independent claims 1 and 34 are not taught or suggested by Kempf and Smook and claims 3, 4, 7, 9, 20-33, 36, and 38 are dependent upon claim 1 or

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claim 34 and contain the same elements as the claim from which they depend, dependent claims 3, 4, 7, 9, 20-33, 36, and 38 are also not taught or suggested by Kempf and/or Smook. In light of the above, Applicants submit that claims 1, 3, 4, 7, 9, 20-34, 36, and 38 are not obvious over Kempf in view of Smook and respectfully request reconsideration and withdrawal of this rejection.

Rejection Under 35 U.S.C. §103(a)

In an Office Action dated August 7, 2009, Claims 1-4, 7-9, 20-34, and 36-38 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,447,602 to Sajbel, *et al.* ("Sajbel").¹ In particular, the Examiner asserts that Sajbel teaches a process for repulping paper that contains a wet strength agent by adding a mixture of peroxide and a metal ion to the pulp. It is also asserted that the metal may be a metal such as iron, copper, and manganese. Additionally, the Examiner asserts that Sajbel teaches that the process is conducted at temperatures from 25 to 100 °C at a pH between 3 and 13. The Examiner admits, however, that Sajbel fails to teach a refining of the repulped paper.

In this regard, Smook is cited for assertedly teaching that it is well-known to refine pulp after the pulp has been treated in the pulping process in order to develop optimal papermaking properties with respect to the product being made. The Examiner concludes that refining the peroxide treated fibers of Sajbel would have been obvious to one of skill in the art in view of Smook to optimize their properties for papermaking.

In response to Applicants' traversal dated November 9, 2009, the Office issued a Final Office Action dated February 19, 2009, stating that the traversal was not convincing because: b) 10ppm is about 0.002%; c) KSR forecloses arguments that a specific teaching, suggestion, or motivation is required to support a finding of obviousness; and d) that there is no requirement that motivation to make the modification be expressly articulated AND one of ordinary skill in the art would be motivated to refine the peroxide treated pulp to develop the optimal properties of the pulp.

¹ Applicants believe that the Examiner intended to reject claims 1-4, 7-9, 20-34, and 36-38 over Sajbel in view of Smook due to the inclusion of Smook in the written comments of the rejection bridging pages 5 and 6 of the Office Action dated August 7, 2009. In this regard, Applicants have treated Smook as being part of the Examiner's rejection.

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Applicants' Response

Initially, Applicants submit that claims 2, 8, and 37 have been canceled without prejudice, thereby rendering the rejection of these claims moot.

In response to the rejection of the remaining claims, Applicants respectfully direct the Examiner's attention to independent claims 1 and 34 and submit that claims 1 and 34 define methods for modulating the morphology of softwood fibers that are not taught or suggested within Sajbel and Smook. Additionally, Applicants respectfully submit that Sajbel and Smook do not teach or suggest the combination of features recited in claims 1 and 34. Sajbel teaches a process for repulping wet-strength paper using at least one peroxide alone or in combination with a non-alkali, non-alkaline earth metal salt or metal chelate. (*See, e.g.*, column 1, lines 58-62). The peroxide compound is employed in an amount of at least 0.1% w/w based on the dry weight of the fiber in the slurry. (*See, e.g.*, column 2, lines 12-14). The metal salt or metal chelate may be used in an amount up to about 10 ppm so as to be sufficient to provide a slurry. (*See, e.g.*, column 2, line 63 to column 3, line 6). Preferred metals are transition metals selected from the group consisting of iron, copper, cobalt, nickel, manganese, silver, titanium, cerium, lead, chromium, vanadium, molybdenum, tungsten, chromium, osmium, and selenium. (*See, e.g.*, column 2, lines 26-31).

Applicants submit that there is no teaching or suggestion within Sajbel of a process for modulating the morphology of softwood fibers where pulp including softwood fibers is subjected to a solution containing a transitional metal ion at a concentration from about 0.002% to about 0.1% by weight based on pulp and a peroxide as required by claims 1 and 34. Sajbel simply does not teach or suggest the claimed amount of transitional metal ion, especially in a method for modulating softwood fibers. Indeed, Sajbel specifically teaches the inclusion of a metal salt or metal chelate in an amount up to about 10 ppm so as to be sufficient to provide a slurry. It is respectfully submitted that Sajbel teaches an amount of a metal-containing compound that is very different from, and much less than, the transitional metal ion concentration claimed in claims 1 and 34.² Smook is silent regarding any teaching or suggestion of a solution containing a transitional metal ion at a concentration from about 0.002% to about 0.1% by weight based on pulp, and as such, cannot make up for the

² It is respectfully submitted that 1 ppm = 0.0001% by weight.

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deficiencies of Sajbel. Further, Sajbel teaches away from the claimed invention because the claimed invention requires the metal ion to be present at an amount that is at least 100% greater than the upper limit taught by Sajbel to be necessary to be sufficient to provide a slurry. Accordingly, it is respectfully submitted that even if Sajbel was combined with Smook, the combination would not result in the methods of claims 1 and 34. Thus, Applicants respectfully submit that claims 1 and 34, and all claims dependent therefrom, are non-obvious and patentable.

Additionally, Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness. As discussed above, to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See, e.g., *Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 7, August 2008, §2143 citing *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007)).

Applicants submit that there is no teaching or suggestion within Sajbel of a method for modulating the morphology of softwood pulp fibers that includes (1) subjecting pulp containing softwood fibers to a solution containing transitional metal ions at a concentration from about 0.002% to about 0.1% by weight based on pulp and a peroxide at a pH of between about 1 and about 9 for a time from about 10 minutes to about 10 hours at a temperature of from about 40 to 120 °C and (2) subjecting the treated fibers to a refining treatment to form refined paper making fibers, where the method reduces fiber suspension viscosity as required by claim 1 or a method for modulating the morphology of softwood fibers that includes (1) adding transitional metal ions at a concentration from about 0.002% to about 0.1% by weight based on pulp to a solution comprising peroxide to form a metal-ion activated peroxide, (2) contacting pulp including softwood fibers with the metal ion-activated peroxide at a pH of between about 1 and about 9 for a time from about 10 minutes to about 10 hours at a temperature from about 40 to 120 °C, and (3) refining the treated fibers to form fibers having a modified morphology, where the method reduces fiber suspension viscosity as claimed in claim 34 based on the teachings of Sajbel and Smook because Sajbel and Smook do not teach or even suggest a solution containing a transitional metal ion at a concentration from about

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0.002% to about 0.1% by weight based on pulp and a peroxide as claimed in claims 1 and 34. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

To the contrary of the Office's conclusory statements c) and/or d) of the outstanding Office Action, Applicant respectfully direct the Office's attention to "Examination Guidelines Update: Developments in the Obviousness Inquiry After *KSR v. Teleflex*" (See *Federal Register Vol. 75, No: 169, pp53643-53660*). In this Office publication, the Office indicates that all of the rationales identified in the KSR Guidelines require some analysis by the Office related to show that the outcome is a "predictable outcome". If the Office cannot show this analysis or support that the outcome is a "predictable outcome", then the Office cannot sustain the obviousness rejection. In the present case, the Office makes conclusory statement that "one of ordinary skill in the art would be motivated to refine the peroxide treated pulp, to develop the optimal properties of the pulp". If Sajbel is solely motivated to keep the amount of metal ion sufficient to provide a slurry, or not more than 10ppm, how can the skilled artisan identify the properties of the pulp that is made from the claimed invention requiring 100% more than the upper range of 10ppm? Applicants respectfully submit that the Office has failed to show that the outcome of the claimed invention is a "predictable outcome" after reading/combining the references as required by "*Examination Guidelines Update*" under KSR. Further, Applicants respectfully submit that it is impossible for the Office to successfully support that the outcome is a "predictable outcome" after reading/combining the references (as required by "*Examination Guidelines Update*" under KSR) because Sajbel's disclosure is clearly in opposite of that of the claimed invention (as discussed above).

Also, as discussed above, Sajbel and Smook do not teach or suggest a process for modulating the morphology of softwood fibers where the pulp is subjected to a solution containing a transitional metal ion at a concentration from about 0.002% to about 0.1% by weight based on pulp and a peroxide. Therefore, Applicants respectfully submit that Sajbel and Smook, alone or in combination, fail to teach all of the claim limitations set forth in claims 1 and 34. Accordingly, it is respectfully submitted that a *prima facie* case of obviousness has not been established for this additional reason.

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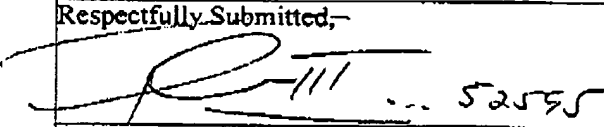
In view of the above, it is respectfully submitted that independent claims 1 and 34 are not taught or suggested by Sajbel and Smook and that claims 1 and 34 are, therefore, non-obvious and patentable. With respect to dependent claims 3, 4, 7, 9, 20-33, 36, and 38. Applicants submit that because independent claims 1 and 34 are not taught or suggested by Sajbel and Smook and claims 3, 4, 7, 9, 20-33, 36, and 38 are dependent upon claim 1 or claim 34 and contain the same elements as the claim from which they depend, dependent claims 3, 4, 7, 9, 20-33, 36, and 38 are also not taught or suggested by Sajbel and/or Smook. In light of the above, Applicants submit that claims 1, 3, 4, 7, 9, 20-25, 27-34, 36, and 38 are not obvious over Sajbel and Smook and earnestly request that this rejection be reconsidered and withdrawn.

Conclusion

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Please charge the amount of \$1110.00 required for the request for extension of time to our Deposit Account No. 09-0525. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 09-0525. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time.

Correspondence Client Number: 01726 (513) 248-6736 (phone) (513) 248-6455 (fax)	Respectfully Submitted, 	
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	(Empty space for additional information)	